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parently, it was in these internodal chambers that the plants stored away what might be designated their reserve water supply. This observation has acquired new significance in the light of the statement made by Atkins that trees store away a supply of water as well as sugar in winter in the dead portions of the woody trunk and that these materials are drawn upon in the early spring for the new growth.

Interesting as this comparison may be in itself, the observation made on the dahlia, together with the peculiar stem structure of this plant, suggested the possible use of the internode with one of the nodes as an osmosis cell where the semipermeable membrane is a live tissue. Hence, I have been wanting to use it as such ever since, but failed to carry out the idea until this morning (October 3, 1918). Having cut down a stem, such a chamber or cell was easily prepared, a dilute salt solution introduced into the cell, the latter capped with a rubber stopper through which a tube was passed down into the cell, and the whole placed into a beaker with distilled water. It did not last long until the salt solution was seen to rise in the tube and at the end of possibly an hour it had risen fully six inches. Before another hour the salt solution had risen to the top of the tube.

A number of possibilities for further experimentation at once suggested themselves, but before going any farther, I thought it advisable to show the experiment to Professor Overton, our plant physiologist. He informed me that, so far as he knew, the experiment was a new one and asked for permission to show it to his class in place of the conventional thistle tube experiment. He called in two other members of the botany department who happened to be passing by. To them also the experiment was new.

Whether I shall be in a position to continue the line of investigation that suggests itself, especially during these times so hostile to research, I have my doubts. Nevertheless the mere possibility of studying osmotic problems, even greatly limited in range, with a living osmotic cell of such convenience as the dahlia

internode and node, is stimulating in itself. It will involve not only chemical problems but a careful anatomical study of the tissues as well. Because of the great amount of reserve materials stored away in the roots, it ought to be an easy matter to raise this osmotic cell-producing plant in greenhouse for winter experimentation.

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### QUOTATIONS

#### FRANCE'S SHARE IN BIOLOGY AND MEDICAL SCIENCE

A COURSE of three lectures on France's share in the progress of science has been delivered at University College, London, by M. Henri L. Joly, professeur des sciences physiques et naturelles au Lycée Français. In the concluding lecture, on November 5, he dealt with biology and the medical sciences, but owing to the wide range of the subject, covering the achievements of at least three centuries, he professed that he could do little more than recite a list of names of greater or less distinction. After references to de Tournefort, Duhamel de Morceau, and Buffon, whom he regarded as a man of letters rather than an exact naturalist, he said that the founder of modern biology in France was Lamarck, who first sought in natural sciences for something beyond description and classification. Xavier Bichat was a pioneer in histology and did much valuable work on the cellular theory. Cuvier was declared to be the greatest of French comparative anatomists, and other naturalists mentioned were Gaudry, one of the early evolutionists; Van Tieghem, to whom very Frenchman studying botany acknowledged a debt; J. H. Fabre, who had done more than any man to popularize natural history in France; Armand Sabatier, the comparative anatomist, and Lecoq, who, the lecturer contended, had anticipated Mendel by twenty years. Turning to Frenchmen whose work had been more particularly in the sphere of medical sciences, after mentioning Mondeville and Guy de Chauliac, M. Joly passed on to the seventeenth century, noting the work of Pecquet on the thoracic duct, of Paris on

ergotism, and of Denys, who performed transfusion of the blood in Paris in 1667. Descartes, who was chiefly known in other scientific connections, did some useful work on visual accommodation, and Lavoisier made a contribution to the chemistry of respiration. He spoke next of Laënnec, of Magendie, who was probably the first experimental pharmacologist; of Le Gallois, who worked on the vagus nerve; of Flourens, who first used chloroform in experiments on animals; of Claude Bernard, who studied the action of the pancreas in diabetes and worked also on the nervous system, and of Paul Bert, his pupil, who organized the teaching of natural sciences in France; of Duchenne, the originator of electrotherapy; of Broca, Charcot, Achard, Dastre, Carrel and others. The work of Pasteur was dealt with in a previous lecture. In concluding, the lecturer referred to the cordial exchange between British and French science which had been maintained for three centuries, save for the interruption of the Napoleonic wars, and said that whenever French scientists had been persecuted by religious bigots they had always found a refuge in England.—*British Medical Journal*.

#### SCIENTIFIC BOOKS

*Medical Contributions to the Study of Evolution.* By J. G. ADAMI. New York, The Macmillan Co. 1918.

Professor Adami has brought together in this volume his Croonian Lectures delivered in 1917 and a number of more or less cognate articles and addresses written or delivered at various times from 1892 onwards. The Croonian Lectures, entitled "Adaptation and Disease," form the *pièce de résistance* of the volume and present evidence drawn from bacteriological and medical sources, which, in the lecturer's opinion, indicate that variation in organisms is something "primarily acquired, proceeding from without," rather than something "primarily inherent, proceeding from within." The evidence submitted consists (1) of the effect of changed environment in producing structural or, more especially, physio-

logical modifications in unicellular organisms, such as bacteria and (2) the effects of immunization in producing physiological modifications of organisms, shown by their increased powers of resistance. In both these classes of cases definite conditions primarily external produce definite modifications and these may therefore be regarded as acquired.

In collating data on the origin of variation from sources that are not always familiar to those whose studies lie in other fields Professor Adami has done good service, but unfortunately he combines with this a vigorous criticism of biologists in general for having failed to recognize the direct action of toxic substances on the germ cells or that of the environment on unicellular organisms. Far from being "shocked" at the suggestion of such ideas biologists have all along accepted them, even Weismann, who seems to be regarded as the *fons et origo* of "academic" biology; indeed, Professor Adami in an address of 1892, reprinted in the present volume, cites from Weismann a statement as to the effect of the environment on protozoa, which might well have been repeated in the lectures. Nor should the implication that zoologists have established a conspiracy of silence regarding Professor Gaskell's theories as to the origin of vertebrates be allowed to pass undisputed. Dr. Adami has apparently forgotten that a symposium upon these theories was held as one of the regular meetings of the Linnean Society, Professor Gaskell's work being thus accorded a recognition and an honor granted but rarely. Zoologists have been by no means unappreciative of the merits of Gaskell's observations even though they may have declined, for reasons that seemed to them sufficient, to accept his theories, and the insinuation that they acted the part of the Levite because Gaskell was a physiologist intruding in their territory is as unjust as it is incorrect.

A chapter on the significance of immunization as an example of a direct adaptation contains much that is of interest to biologists in general and this is followed by a chapter